

**INF3705**

( 471952)    October/November 2015

**ADVANCED SYSTEMS DEVELOPMENT**

Duration    2 Hours

100 Marks

**Examiners:**

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Closed book examination

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This examination question paper consists of 6 pages plus instructions for the completion of a mark-reading sheet.

**INSTRUCTIONS**

- 1** Answer section A on the mark-reading sheet, and the rest of the questions in the answer book.
- 2** This paper consists of two sections, section A, 50 marks and section B, 50 marks. The total mark is 100
- 3** All rough work must be done in the answer book
- 4** The mark for each question is given in brackets next to the question.
- 5** Please answer the questions in the order in which they have been set. If you wish to leave out a question temporarily and come back to it later, leave sufficient space for it in your answer book

TURN OVER

**SECTION A: MULTIPLE-CHOICE QUESTIONS [50 MARKS]**

- 1 Which one of the following is not an essential attribute of good software development?
  - 1 Maintainability
  - 2 Dependability and security,
  - 3 Efficiency and acceptability
  4. Competence
- 2 The two fundamental types of software product are\_\_\_\_
  - 1 Generic products and customized products
  - 2 Company product and generic product
  - 3 Company product and customized product
  - 4 Company product and developer product
- 3 An engineering discipline which deals with all aspects of software production from specification to system maintenance is termed\_\_\_\_
  - 1 System engineering
  - 2 Software engineering
  - 3 Product engineering
  - 4 Tools engineering
4. Which of this general issue does not affect software development?
  - 1 Heterogeneity
  - 2 Business and social change
  3. Security and trust
  4. Confidentiality
- 5 Which of the following is appropriate for the incremental model of software development?
  1. When developments methods are flexible
  - 2 When the process of software development is well defined
  - 3 When a core product is required quickly.
  - 4 All of the above
- 6 The most appropriate situation for agile method of software development is\_\_\_\_
  1. When developments methods are flexible
  2. When the process of software development is well defined
  - 3 When requirements are well known in advance
  - 4 All of the above

TURN OVER

7 Which of the following needs to be assessed during unit testing?

- 1 Algorithmic performance
- 2 Code stability
- 3 To test during development.
- 4 All of the above

8 What is the purpose of load testing?

- 1 To test the response rate of the system
- 2 To test the number of transactions that the system can handle simultaneously
- 3 To test during development.
- 4 All of the above

9 The purpose of performance testing is to\_\_\_\_\_.

- 1 To test the response rate of the system.
2. To test the number of transactions that the system can handle simultaneously
3. To test during development.
- 4 All of the above

10 Which of the following involves Usability testing?

1. Deployment testing
- 2 Requirements validation
- 3 Load testing
- 4 All of the above

11 As a system developer, which of the following are elements to be considered in systems design?

- 1 Architecture, data and interfaces
2. Data interfaces and project scope.
- 3 Systems models.
- 4 All of the above.

12. Which of the following are concerns of software engineering?

- 1 Architecture, data and interfaces
- 2 Data interfaces and project scope.
3. Systems models.
- 4 All of the above

13 An architectural style encompasses which of the following elements?

- 1 Constraints
- 2 Set of components
- 3 Semantic models
- 4 All of the above

14 To determine the architectural style or combination of styles that best fits any proposed system, requirements engineering is used to uncover \_\_\_\_\_

- 1 Algorithmic complexity
- 2 Characteristics and constraints
- 3 Control and data
- 4 Design patterns

15. Which of the following are elements of systems requirements?

1. Architecture, data and interfaces
- 2 Data, interfaces and project scope
- 3 Systems models
- 4 All of the above

16 Which of the following is preferable of software modules?

1. Low cohesion and high coupling
- 2 High cohesion and high coupling
- 3 High cohesion and low coupling
- 4 It depends on the situation

17 Cyber security dealing with secrecy or confidentiality threats is referred to as \_\_\_\_\_

- 1 Unauthorized modification of data
- 2 Denial of access to data and services
- 3 Unauthorized viewing of data
- 4 All of the above

18 Integrity threats refer to one of the following

1. Unauthorized modification of data
- 2 Denial of access to data and services
- 3 Unauthorized viewing of data
- 4 All of the above

19 Denial of access or availability threats refers to \_\_\_\_\_

- 1 Unauthorized modification of data
- 2 Denial of access to data and services
- 3 Unauthorized viewing of data
- 4 All of the above.

20. Which of the following can be classified as a Model–View–Controller (MVC) architectural pattern?

- 1 It has three components
2. Has clients and servers
3. It is a sequential model of processing.
- 4 None of the above

21. Prototyping involves development of \_\_\_\_\_
- 1 Initial demonstration of concepts.
  - 2 A final product.
  - 3 A stable product.
  - 4 Beta version of the product
- 22 Which of the following is an attribute of a dependable software engineering process?
- 1 Documentable
  2. Standardized.
  - 3 Auditable.
  - 4 All of the above
- 23 Redundancy and diversity are fundamental strategies in the dependability of a system  
Which of the following is an example of diversity?
- 1 A spare/extra capacity
  2. Object oriented design.
  - 3 Avoiding a single point of failure
  - 4 All of the above.
24. Which of the following exploits on reusable components in its design?
- 1 A backup mechanism
  - 2 Object oriented design
  - 3 Avoiding a single point of failure
  4. All of the above
25. Socio -Technical systems is made up of different components including \_\_\_\_\_
1. Equipment
  - 2 Operating system
  - 3 Society
  4. All of the above

**SECTION B: STRUCTURED QUESTIONS [50 MARKS]****QUESTION 1 [10]**

Members of your software development team think that agile methods should be based on *principles*. Explain the principles of agile methods to the team members

**QUESTION 2 [6]**

What are the fundamental concepts of user and system requirements and why must these requirements be written in different ways?

**QUESTION 3 [10]**

As a system developer, your organization requires you to make a decision on system architecture. Explain to your organization members what decisions have to be made about the system during the architectural design process?

**QUESTION 4 [8]**

Development testing forms an integral aspect of system development. Explain the following, unit testing, component testing and system testing

**QUESTION 5 [8]**

Briefly describe three main types of software maintenance. Why is it sometimes difficult to distinguish between them?

**QUESTION 6 [8]**

What are the strategic options for legacy system evolution? When would you normally replace all or part of a system rather than continue maintenance of the software?

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